

CLAIMS

What is claimed is:

1. A radial ply pneumatic tire comprising
 - a) an annular tread, the tread having at least one circumferentially extending groove and a pair of lateral tread edges, the axial distance between the lateral tread edges defining the tread width,
 - b) at least one pair of reinforcing belts located radially inwardly of the tread,
 - c) a pair of sidewalls, each sidewall extending radially inwardly from each lateral tread edge,
 - d) a tire carcass structure comprising a pair of bead cores, each bead core being located radially inwardly from each sidewall, and a carcass reinforcing structure radially inward of the reinforcing belts extending circumferentially about the tire from one of the pair of bead cores to the other one of the pair of bead cores, the carcass reinforcing structure having at least one ply, each ply having a pair of turnup ends; and
 - e) a circumferentially extending ring in the at least one circumferentially extending grooves, the ring comprising a coated inextensible material and being radially inward of the at least one pair of reinforcing belts.
2. The tire according to claim 1, the at least one circumferentially extending groove having a base defining the bottom of the groove, wherein the base of the groove is radially inward of the at least one pair of reinforcing belts.
3. The tire according to claim 1, the tire further comprising:
 - f) an interior cavity, wherein the at least one circumferentially extending groove extends into the interior cavity by a depth D of 10-30% of the tire sectional height H.
4. The tire of claim 1, the tire further comprising:
 - f) at least a pair of fillers, each filler being located in each sidewall and extending from a location radially inward of the lateral tread edges to radially outward of the bead cores.

5. The tire of claim 1, wherein each turnup end of the carcass reinforcing ply passes radially inward of the bead core and extends radially outward adjacent to the carcass reinforcing ply.
6. The tire of claim 1 wherein the tread has at least two circumferentially extending grooves, and a circumferentially extending ring in each circumferentially extending groove, the ring in each groove being radially inward of the at least one pair of reinforcing belts.
7. The tire of claim 6 wherein the tire has three sets of reinforcing belts, each of the sets of reinforcing belts being separated by one of the circumferentially extending grooves.
8. The tire of claim 1 wherein the circumferentially extending ring is comprised of a material selected from the group consisting of thermoplastic, thermoelastomer, or plasticized elastomer.
9. The tire of claim 1 wherein the inextensible material of the circumferentially extending ring is selected from the group consisting of steel, carbon fiber, fiberglass, aramid, a nylon, or a polyester.
10. The tire of claim 1 wherein the circumferentially extending ring is comprised of reflective or fluorescent materials that are seen on the radially outer surface of the circumferentially extending ring.
11. A run-flat tire assembly comprising a tire, a tire wheel upon which the tire is mounted forming a tire cavity, and a support ring mounted on the tire wheel inside the tire cavity, wherein:
the tire is comprised of:
 - a) an annular tread, the tread having a pair of lateral tread edges, the axial distance between the lateral tread edges defining the tread width, and at least one circumferentially extending groove,

- b) at least one pair of reinforcing belts located radially inwardly of the tread,
- c) a pair of sidewalls, each sidewall extending radially inwardly from each lateral tread edge,
- d) a tire carcass structure comprising a pair of bead cores, each bead core being located radially inwardly from each sidewall, and a carcass reinforcing structure radially inward of the reinforcing belts extending circumferentially about the tire from one of the pair of bead cores to the other one of the pair of bead cores, the carcass reinforcing structure having at least one ply, each ply having a pair of turnup ends, each turnup end passing first radially inward of the bead core and then extending radially outward adjacent to the carcass reinforcing ply, and
- e) a circumferentially extending ring in the at least one circumferentially extending grooves, the ring comprising a coated inextensible material and being radially inward of the at least one pair of reinforcing belts,

and the support ring is comprised of:

a radially outer surface for contact with the radially inner surface of the tire cavity for when the run-flat assembly is operated at a reduced pressure, the radially outer surface having a continuous circumferential groove located therein,

wherein the tire circumferential groove and the support ring circumferential groove are axially coincident such that when the run-flat assembly is operated at a reduced pressure, the tire circumferential groove and at least a portion of the ring therein are located within the support ring circumferential groove.

- 12. The tire assembly of claim 11 wherein the tread has at least two circumferentially extending grooves, and a circumferentially extending ring in each circumferentially extending groove, the ring in each groove being radially inward of the at least one pair of reinforcing belts.
- 13. The tire assembly of claim 12 wherein the tire has three sets of reinforcing belts, each of the sets of reinforcing belts being separated by one of the circumferentially extending grooves.

14. The tire assembly of claim 11 wherein the circumferentially extending ring is comprised of a material selected from the group consisting of thermoplastic, thermoelastomer, or plasticized elastomer.
15. The tire assembly of claim 11 wherein the inextensible material of the circumferentially extending ring is selected from the group consisting of steel, carbon fiber, fiberglass, aramid, a nylon, or a polyester.